pairs of sockets and balls joined by trunnions, the same degree of reorientation is possible, but without the binding axial force. The only friction acting against pivoting reorientation of the outlet **28** is in the trunnions, therefore the torque due to friction is vastly reduced and, thus the present invention is usable where prior swivels are not. The threads of the trunnions **56**, **88** and **114** are preferably fixed from threaded rotation by use of a high strength anaerobic adhesive such as made by the Loctite Corporation and sold under the trademark Loctite #271.

Downstream from the second ball **106** is a nozzle coupling **118** that is preferably threaded to receive a variety of nozzles. When a nozzle is fitted to the pivoting outlet **28**, the nozzle's weight will force the outlet **28** to pivot downward. Obviously, unintended redirection of the nozzle is not desirable so the present invention is preferably fitted with a mechanism to resist unintended movement. The nozzle coupling **118** may also be connected to or integrally formed with any desired connector style, or be integrated with the nozzle inlet itself. It is to be understood that additional ball and socket combinations could be added to the above-described double ball and socket combinations to add additional range of motion in a pivoting connector.

As illustrated in FIGS. **4** and **5**, there is a one-way brake **200** that restricts pivoting movement in one direction about an axis while permitting unrestricted movement in the opposite direction about the same axis. Thus, raising movement of the pivoting outlet **28** and its nozzle is not restricted, but a lowering movement of the nozzle is prevented unless intended by the firefighter. Although there is depicted only one one-way brake, a second one-way brake could be added to restrict movement about the other axis.

The one-way brake **200** includes: a trunnion **202**, a sleeve **204** fitted to the trunnion **202**, springs **206**, cylinders **208**, and a brake housing **210**. The trunnion **202** can be any trunnion in either the pivoting inlet **26** or the pivoting outlet **28**, but is preferably in the pivoting outlet **28** and horizontally oriented to resist nozzle weight. The trunnion **202** is fixed to either the ball or the socket of the pivoting joint, but in the illustrated example is fixed to the ball **80**. A shoulder **212** is part of the trunnion **202** to provide a surface for the sleeve **204** to bear against.

The sleeve **204** is operable to engage the trunnion **202** due to a spring washer **235** and nut **236** that provide axial load to push the sleeve **204** into the shoulder **212** on the trunnion **202**. This axial load provides rotational drag due to friction between the faces of the sleeve **204**, the shoulder **212**, and the spring washer **235**. The position of the nut **236** is fixed by a tapered pipe plug **240** that is threaded into the trunnion **202**. The trunnion **202** is slotted so that when the tapered pipe plug **240** is inserted, the trunnion **202** expands to fix the nut **236**.

The sleeve **204** is shaped to provide steps **216** on which the springs **206** and cylinders **208** can act to resist unintended movement. The sleeve **204** can have as many steps **216** as necessary to resist expected loads and provide smooth one-way brake movement. As examples, the FIG. **4** embodiment illustrates six steps **216** and the FIG. **5** embodiment illustrates three steps **216**. The sleeve **204** is disposed in a cylindrical opening **209** of the brake housing **210** and together with the sleeve steps **216** define tapered slots **218** having a wide end **220** and a narrow end **222**.

Inside the tapered slots **218**, the cylinders **208** and springs **206** are disposed, as illustrated in FIG. **4** with the springs **206** toward the slot wide ends **220** and the cylinders **208** toward the tapered slot narrow ends **222**. In this manner, the springs **206** urge the cylinders **208** into the tapered slot narrow ends **222**. Friction between the cylinders **208** and the brake housing **210** prevents the sleeve **204** from rotating relative to the brake housing **210**, thereby preventing free rotation of the pivoting joint about the trunnion **202** in the locked direction **226**. On the other hand, rotation in the unlocked direction **228** is possible because the cylinders **208** move toward the tapered slot wide end **220** where there is little or no friction between the cylinders **208** and the brake housing **210**. The springs **206** may be of any type including compression, leaf, or preferably, elastometric tubing of silicone rubber material inserted along an axis parallel with the axis of the cylinders **208**.

The weight of a nozzle causes the cylinders **208** to move toward the small end of the tapered space **222** and effectively lock the sleeve **204** to the brake housing **210**. Friction between the sleeve **204**, the trunnion **202**, and the spring washer **236** support the weight of the nozzle. To lower the nozzle's elevation, an operator merely pushes down on the nozzle to overcome the friction between the sleeve **204** and the trunnion shoulder **212**. To raise the nozzle, an operator pulls up on the nozzle causing the cylinders **208** to the wide end of the slot **220** thereby releasing the sleeve from the brake housing **210** and allowing the nozzle to move up without drag from the sleeve **204**. Tapered slots **218** are preferably shaped to define a four degree pinch angle with a one inch diameter cylindrical opening **209**, and the cylinders **208** are ⅛ of an inch in diameter.

The brake housing **210** is fixed to the opposite component of the pivoting joint to which the trunnion **202** is fixed. A simple crew **232** makes the connection.

The foregoing detailed description of drawings is provided for clearness of understanding only, and no unnecessary limitations therefrom should be read into the following claims.

What is claimed is:

1. A pivoting fluid conduit joint comprising:

a socket;

a ball disposed in the socket for movement relative to the socket; and

a trunnion joining the ball and socket to permit relative pivoting movement between the ball and socket about an axis defined by the trunnion, wherein the trunnion is fixed to the ball, and

a one-way brake, wherein the one-way brake comprises:

a stepped sleeve operable to engage the trunnion;

a brake housing fixed to the socket and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;

a cylinder disposed in the tapered slot; and

a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

2. A pivoting fluid conduit joint comprising:

a socket;

a ball disposed in the socket for movement relative to the socket;

a trunnion joining the ball and socket to permit relative pivoting movement between the ball and socket about an axis defined by the trunnion, wherein the trunnion is fixed to the socket; and

a one-way brake wherein the one-way brake comprises:

a stepped sleeve operable to engage the trunnion;

a brake housing fixed to the ball and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;

a cylinder disposed in the tapered slot; and

a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

3. A pivoting fluid conduit joint defining a conduit, comprising:

a first socket;

a first ball disposed in the first socket and pivotably joined to the first socket along a first axis;

a second socket fixed to the first ball;

a second ball disposed in the second socket and pivotably joined to the second socket along a second axis oriented at a substantially right angle to the first axis;

a trunnion fixed to the first ball; and

a brake for resisting pivoting movement of the first ball relative to the first socket, wherein the brake comprises:

a stepped sleeve operable to engage the trunnion;

a brake housing fixed to the socket and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;

a cylinder disposed in the tapered slot; and

a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

4. A pivoting fluid conduit joint defining a conduit, comprising:

a first socket;

a first ball disposed in the first socket and pivotably joined to the first socket along a first axis;

a second socket fixed to the first ball; and

a second ball disposed in the second socket and pivotably joined to the second socket along a second axis oriented at a substantially right angle to the first axis;

a trunnion fixed to the first socket, and a brake for resisting pivoting movement of the first ball relative to the first socket, wherein the brake comprises:

a stepped sleeve operable to engage the trunnion;

a brake housing fixed to the ball and defining a cylindrical opening for receiving the stepped sleeve, the brake housing and the stepped sleeve cooperate to define a tapered slot having a wide end and a narrow end;

a cylinder disposed in the tapered slot; and

a spring disposed in the wide end of the tapered slot to urge the cylinder toward the narrow end of the tapered slot.

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